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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,145	03/19/2004	Kenneth A. Frankel	720010.401	8651
31740	7590	01/19/2007		
THOMAS LOOP P.O. BOX 21466 SEATTLE, WA 98111			EXAMINER WOLLSCHLAGER, JEFFREY MICHAEL	
			ART UNIT	PAPER NUMBER
			1732	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/19/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/805,145

Applicant(s)

FRANKEL, KENNETH A.

Examiner

Jeff Wollschlager

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 01 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Applicant's amendment to the claims filed November 1, 2006 has been entered. Claims 14-19 are canceled. Previously presented claims 1-13 are pending and under examination.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 6, 9, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Von Volkli (U.S. Patent 4,693,678).

Regarding claims 1-3 and 13, Von Volkli teaches a method for fabricating reinforced composite structures wherein a support fixture/mandrel (12) containing holes/recesses (22) is surrounded by a flexible rubber boot (14). The boot is held in place on the support fixture by applying a vacuum between the fixture and the boot (abstract; col. 3, lines 14-19). Prepregs are applied about the boot in a desired configuration (abstract; col. 1, lines 28-31) and other materials such as a honeycomb core (60) and machining prepreg plies (56) can be positioned adjacent and proximate the hole/recessed defined in the mandrel (col. 5, lines 50- col. 6, line 10; Figure 4). The uncured assembly is placed into a mold (col. 3, lines 20-43). The vacuum between the

support fixture and the boot is broken (col. 6, lines 59-62; Figure 3G) thereby necessarily increasing the gas pressure between the fixture and the boot and then in conjunction with the vacuum applied between the boot and the mold (16) causes the uncured part to conform to the interior surface of the mold (col. 6, lines 54-61). The mandrel is removed, the mold is heated to cure the composite material, and the boot is removed (col. 6, line 54 - col. 7 line 20).

As to claim 6, the boot employed by Von Volkli is made of silicone rubber (col. 4, line 25).

As to claim 9, the female mold is an open-ended split mold (Figure 1, (18)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 5-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frikken et al. (U.S. Patent 4,202,856) in view of Nelson (U.S. Patent 6,458,306) and further in view of either of Hladik et al. (U.S. Patent 3,989,562) or Maison et al. (U.S. Patent 6,613,258).

Regarding claim 1, Frikken et al. teach the basic claimed process of manufacturing a hollow graphite-epoxy composite structural part wherein a mandrel having an external configuration similar to but smaller than the configuration of the part

to be produced is encased by a superimposed flexible bag forming an elastic bladder about the mandrel (col. 1, lines 5-16). Pre-impregnated graphite epoxy plies are placed upon the mandrel/bag combination as required and the assembly is placed in a split mold having an interior cavity corresponding to the exterior configuration of the part to be produced (col. 1, lines 16-26). A high pressure fluid is employed to force the uncured part to the interior surface of the mold and the mold is heated to cure the resin (col. 1, lines 26-30). The mold is opened and the mandrel and the flexible bag are removed (col. 1, lines 31-35). Frikken et al. do not disclose employment of a vacuum between the bladder and the mandrel nor do they disclose providing a mandrel with recesses and positioning a core, structural insert or a veneer piece adjacent and proximate one of the recesses.

However, in analogous methods for forming hollow composite articles, Nelson discloses employment of a vacuum between the bladder and the mandrel (col. 12, lines 62-65) and Hladik et al. (col. 1, lines 42-44; col. 2, lines 23-37) and Maison et al. (Figure 2; elements (12) and (16); col. 3, lines 39-43; col. 6, lines 43-48) individually show mandrels/formers with recesses and positioning reinforcing materials/stiffeners adjacent and proximate the recesses.

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to employ a vacuum between the bladder and the mandrel as disclosed by Nelson while practicing the method of Frikken et al. for the purpose, as taught by Nelson, of having the bladder conform to the mandrel core (col. 12, lines 62-65) and to employ a mandrel/former with recesses and positioning

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reinforcing materials/stiffeners adjacent and proximate the recesses, as taught individually by both Hladik et al. and Maison et al. for the purpose, as taught by Hladik et al., for example, of increasing the strength and rigidity of the hollow article (col. 1, lines 42-45).

As to claim 2, Hladik et al. disclose the piece may be made from honeycomb material (col. 1, lines 33-36).

As to claim 3, Maison et al. disclose the stiffener piece is made of plastic (col. 4, lines 23-27).

As to claim 5, Nelson et al. teach the mandrel can be made of foam (col. 10, line 49) or any readily soluble in water material that presents no extensive waste disposal costs (col. 11, lines 37-40). It is noted that wax is also a well known and an obvious choice in the art of making hollow articles.

As to claim 6, Frikken et al. disclose the bladder is made from silicone rubber (col. 2, lines 62-65).

As to claims 7 and 8, Frikken et al. employ graphite epoxy plies (abstract; col. 2, lines 27-35).

As to claim 9, Frikken et al. employ an open-ended split mold (Figure 5).

As to claims 10-12, Frikken et al. disclose values within the claimed ranges (col. 3, lines 10-35).

As to claim 13, Nelson et al. teach applying a second vacuum between the uncured part and the interior surface of the mold (col. 5, lines 8-10).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frikken et al. (U.S. Patent 4,202,856) in view of Nelson (U.S. Patent 6,458,306) and further in view of either of Hladik et. al (U.S. Patent 3,989,562) or Maison et al. (U.S. Patent 6,613,258), as applied to claims 1-3 and 5-13 above, and further in view of Ayorinde (U.S. Patent 6,444,071).

As to claim 4, the previously applied combination teaches the method of claim 1, but does not teach employment of a wood piece. However, Ayorinde discloses that honeycomb cores, foam, balsa wood and the like are art-recognized equivalents (col. 1, lines 29-35).

As such, it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to employ the art recognized equivalent wood core disclosed by Ayorinde to replace the material inserts disclosed by the previously applied combination since it has been held that choosing between art recognized equivalents for the same purpose is *prima facie* obvious absent new or unexpected results.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Von Volkli (U.S. Patent 4,693,678), as applied to claims 1-3, 6, 9, and 13 above, in view of Ayorinde (U.S. Patent 6,444,071).

As to claim 4, Von Volkli teach the method of claim 1 and further disclose employment of a honeycomb core material (col. 6, lines 8-10). However, Ayorinde

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discloses that honeycomb cores, foam, balsa wood and the like are art-recognized equivalents (col. 1, lines 29-35).

As such, it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to employ the art recognized equivalent wood core disclosed by Ayorinde to replace the honeycomb core disclosed by Von Volkli since it has been held that choosing between art recognized equivalents for the same purpose is *prima facie* obvious absent new or unexpected results.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Von Volkli (U.S. Patent 4,693,678), as applied to claims 1-3, 6, 9, and 13 above, in view of Faiz et al. (U.S. Patent 4,681,724).

As to claim 5, Von Volkli teach the method of claim 1, but do not disclose a foam or wax mandrel. However, Faiz et al. disclose that a foam mandrel, while not necessarily being reusable, provides a considerable cost advantage over other mandrels (col. 6, lines 52-66) and further disclose that wax mandrels are known in the art (col. 1, lines 29-30).

As such, it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to employ conventional foam or wax molds in the method disclosed by Von Volkli for the purpose of providing a low cost alternative.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Von Volkli (U.S. Patent 4,693,678), as applied to claims 1-3, 6, 9, and 13 above, in view of Fujino et al. (U.S. Patent 6,399,199; issued June 4, 2002).

As to claims 7 and 8, Von Volkli disclose preregs as discussed in the rejection above, but do not expressly teach the specific fibers and resins that comprise the preregs. However Fujino et al. teach resin impregnated fibers used for analogous composite materials include vinyl ester resins, polyester resins, phenolic resins, and epoxy resins (col. 1, lines 48-53). These resins are combined with carbon fibers and glass fibers (col. 1, lines 38-39) to form composite materials.

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to employ conventional preregs as disclosed by Fujino et al. in the method of Von Volkli for the purpose as taught by Fujino et al. of providing excellent impregnation of the reinforcing fibers (col. 1, lines 43-46).

Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Von Volkli (U.S. Patent 4,693,678).

Regarding claims 10-12 Von Volkli does not teach the claimed molding pressures, temperatures, or curing times. However, Von Volkli disclose varying the thickness and orientation of the applied plies based on the specific needs of the final application (col. 5, lines 43-50; abstract). The thickness and orientation of the plies would impact the selected pressure, temperature and curing times to be employed. As such, one of ordinary skill in the art would have had to take this into consideration when

determining the mold conditions and would have readily optimized these conditions to produce a cured composite, as is routinely practiced in the art.

Response to Arguments

Applicant's arguments see the REMARKS filed November 1, 2006, with respect to the rejection of claims 1-13 have been fully considered and are persuasive.

Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made as presented above.

Conclusion

All claims are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Wollschlager whose telephone number is 571-272-8937. The examiner can normally be reached on Monday - Thursday 7:00 - 4:45, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JW

Jeff Wollschlager
Examiner
Art Unit 1732

January 11, 2007


CHRISTINA JOHNSON
SUPERVISORY PATENT EXAMINER

1/17/07